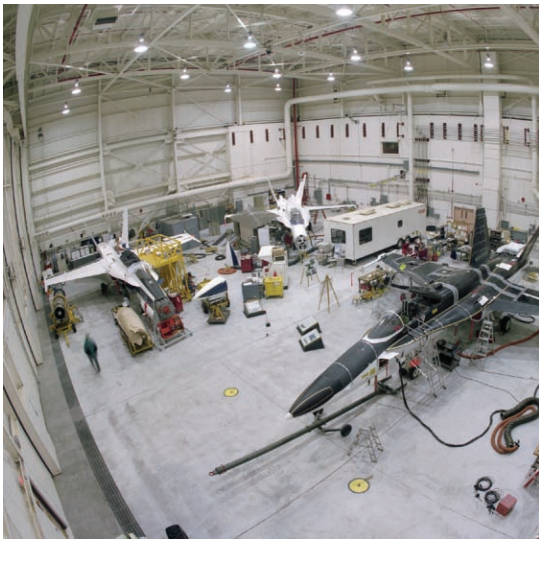
NASA's **Aeronautics Test Program**

Research Aircraft Integration Facility

NASA Dryden's Research Aircraft Integration Facility (RAIF) provides the ability to seamlessly integrate simulation and vehicle software and hardware systems under a single roof. This one-of-a-kind facility can simultaneously support a wide variety of advanced, highly integrated aerospace vehicles through all phases of a research program from conceptual design to flight.

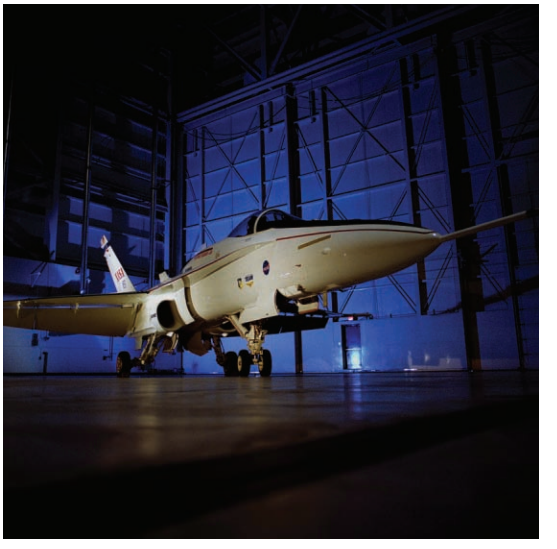
The RAIF offers high-fidelity 6-DOF (degree-of-freedom) batch and in-real-time flight simulation capabilities, as well as support for system integration and closed-loop verification and validation testing of vehicle components and flight vehicles. Also available are complete aircraft ground-support services, including all electrical, hydraulic, and cooling-air systems required for vehicle-system integration, functional checks, and routine aircraft maintenance.



Facility Benefits

With simulation capabilities, the RAIF

- Provides research teams with the means to conduct efficient, thorough testing of advanced, highly integrated research vehicles
- Provides configurable systems for all facets of a research program including simulation software and hardware, as well as direct vehicle support infrastructure
- Provides scalable systems for
  - Evaluation of design concepts
  - Piloted and vehicle- and hardware-in-the-loop operations
  - Combined systems testing capability
  - System integration and full mission support
  - Control-room training, mission planning, and data analysis
- Can be configured to accommodate up to 11 simulation laboratories
- Can be tailored to support varying access and security requirements within each lab
- Offers audio, video, and data connectivity to any of the six facility hangar bays as well as to the Dryden Mission Control Center



Facility Applications

The RAIF has been a critical asset for the successful implementation of some of the nation's most revolutionary and valuable research efforts. These efforts supported a variety of classes of research vehicles that cover subsonic through hypersonic flight regimes, including X–43A (Hyper-X), F–18, F–15, and C–17.

Data Acquisition and Processing

- Simulation software capabilities:
  - High-fidelity, 6-DOF simulation packages
  - Same software simulation package supports both real-time (human-in-the-loop and hardware-in-the-loop) and non-real-time (desktop) operations
  - Common, configurable software supporting multiple projects
  - Multiple operating system platforms (Solaris and Linux)
  - Multiple language support (FORTRAN, C, C++, Java, and Ada)
  - Multiview out-the-window graphics with heads-up display (HUD) and three-dimensional model of flight vehicle
  - Operable by one person in non-real-time and real-time environments
- Simulation hardware capabilities:
  - Dedicated or configurable fix-base engineering simulation cockpits
  - Configurable hardware interface units for vehicle-systems integration testing
  - Common configurable hardware to support multiple projects
  - Configurable simulation electric stick (SES) and rudder pedal systems
  - Configurable Cockpit Interface Unit (CIU)
  - Flight hardware interface capability (MIL–STD–1553, ARINC 429, and analog and discrete signals)

Characteristics

- Test bays 1, 2, and 3 provide over 30 000 ft^2 hangar space
- The 225- by 135-ft hangar, accessible through a split 225- by 50-ft door
- Test bays 4 and 5 provide a total of 12 500 ft^2 of hangar space
- Test bay 6 is a single-vehicle bay 1000 ft^2 of hangar space that can be configured to support programs with more stringent security requirements
- Test bay data and communication connectivity to RAIF simulation labs and Dryden control rooms
- Co-located vehicle maintenance support staffing
- Co-located program and vehicle engineering and technician staff
- Complete vehicle support systems (aircraft cooling, electrical power, and hydraulics)
- Electrostatic Discharge Association (ESD)-certified support labs

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